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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,351	02/26/2002	Peter Cripps	MAGN002/01US	9717

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EXAMINER	
AGHDAM, FRESHTEH N	
ART UNIT	**PAPER NUMBER**
2631	

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/082,351	CRIPPS ET AL.	
	Examiner	Art Unit	
	Freshteh N. Aghdam	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 February 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-13 and 15-22* is/are rejected.

7)☒ Claim(s) *4 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 1, 3, 8, 13, and 22 are objected to because of the following informalities:

As to claims 1, 3, 13, and 22, the expression "substantially optimized" does not fully describe the scope of invention and should be replaced by a more descriptive expression at page 21, line 11.

As to claim 8, the expression "with the a remaining frequency" should be rewritten as "with the remaining frequency" at page 23, line 6.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 5, 6, 7, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapira (US 2003/0060205), and further in view of Rouphael et al (US 6,400,317).

As to claims 1 and 22, Shapira teaches an antenna control system in a communication network wherein a plurality of data and pilot signals (190) are received by a plurality of antenna elements; each pilot signal from the plurality of pilot signals

being associated with a pilot signal from the plurality of pilot signals having the second characteristic (i.e. strength or power level); obtaining and categorizing pilot signals based on the second characteristic of the pilot signals (Fig. 6); adjusting the weight values of all antenna elements so that the second characteristic of the desired pilot signal is optimized (Fig. 2 and 6; Pg. 3, Par. 52; Pg. 4, Par. 65). Shapira is silent about each data signal being uniquely associated with a pilot signal; and detecting the pilot signals based on the first characteristic of the pilot signals. It is well known in the art to transmit data signals being uniquely associated with pilot signals see the provided pertinent reference (US 2002/0012380; Fig. 4). Rouphael et al teach a method and apparatus for antenna control in a communication network in which a pilot signal is detected and the signal quality metrics are measured to adjust the phase shift, delay line, amplifier with variable gain) of the antenna elements (Col. 4, Lines 35-49). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Rouphael et al with Shapira in order to maximize the received signal energy (Col. 9, Lines 5-7).

As to claim 2, Rouphael et al teach adjusting the received signals with respect to the amplitude (i.e. first weight), phase (second weight), or both of the signal received or transmitted from each antenna element (101-105) see (Fig. 2; Col. 7, Lines 20-26); and transmitting the modified transmission data (Col. 7, Lines 34-36). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Rouphael et al with Shapira in order to maximize the received signal energy (Col. 9, Lines 5-7).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shapira and Rouphael et al, further in view of Agee et al (US 6,621,851).

As to claim 3, Shapira and Rouphael et al teach all the subject matters claimed above, except for storing a plurality of signal samples for the first pilot signal and filtering the plurality of signal samples for the first pilot signal to produce a plurality in phase signal samples and a plurality of quadrature signal samples, the first weight value being associated with the plurality of in-phase signal samples, a second weight value being associated with the plurality of quadrature signal samples; and iteratively adjusting the first and second weight values associated with each antenna element from plurality of antenna elements. Agee et al, in the same field of endeavor, teach receiving signals at each antenna element and digitizing the received signals at each antenna element (i.e. digital baseband signals) and weighting the digital baseband signals and adjusting the numerical representation of their amplitudes and phases (Col. 2, Lines 57-67). Rouphael et al teach adjusting the weight values of each antenna element iteratively (Fig. 3) to optimize the reception quality of pilot signals. One of ordinary skill in the art would clearly recognize that it is well knownin the art to use memory devices for storing any types of signals. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Agee et al with Shapira and Rouphael et al in order to process the signals received by the adaptive antenna array and to separate interference and noise from genuine received signals (Col. 2, Lines 57-67).

As to claims 5-7, Shapira and Rouphael et al teach all the subject matters claimed above, except for the plurality of data signals associated with a data frequency

band within an allocated frequency band; the plurality of pilot signals each is uniquely associated with a pilot signal band within the allocated frequency band and outside the data frequency band (see the recited pertinent reference as recited in claim 1); the first characteristic of each pilot signal from the plurality of pilot signals is at least one from the group of: a frequency of an unmodulated carrier wave , a modulation, and a frequency of a modulated carrier wave or the first characteristic is a spread spectrum pseudo noise sequence or the first characteristic is a time delay. Rouphael et al teach a pilot signal is detected and the signal quality metrics (i.e. signal to noise ratio, or signal to interference noise ratio, and/or so on) are measured to adjust the phase shift, delay line, amplifier with variable gain) of the antenna elements (Col. 4, Lines 35-49). One of ordinary skill in the art would clearly recognize that allocating frequency bands to pilot signals is well known in the art and it could be either dedicating separate channels to pilot signals with the predetermined frequency bands or attaching pilot symbols to data signals. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Rouphael et al with Shapira in order to maximize the received signal energy (Col. 9, Lines 5-7).

Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapira and Rouphael et al, further in view of Sato (US 2005/0083875).

As to claims 8-11, Shapira and Rouphael et al teach all the subject matters claimed above, except for each pilot signal from plurality of pilot signals is uniquely associated with a modulation code, each pilot signal from the plurality of pilot signals is uniquely associated with the remaining frequencies from the plurality of frequencies;

and the first characteristic of each pilot signal from the plurality of pilot signals is the modulated code. Sato teaches a pilot symbol could be either added to each data channel or transmitted using separate channels wherein each pilot signal is responsive to one or a plurality of data signals to determine the delay, de-spreading timing of data channel, phase, and amplitude (Pg. 1, Par. 5, 8, and 9). One of ordinary skill in the art would clearly recognize that it is well known in the art that each symbol is associated with a frequency band and each packet of information (i.e. frame or block of information) comprises either a frequency band or a plurality of frequency bands. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Sato with Shapira and Rouphael et al in order to use an efficient coherent detection scheme (Pg. 1, Par. 9).

Claims 12, 13, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapira, further in view of Rouphael et al and Agee et al (US 6,621,851).

As to claims 12 and 13, Shapira and Rouphael et al teach configuring antenna elements to receive a plurality of data signals and a plurality of pilot signals, each data signal from the plurality of data signals being uniquely associated with a pilot signal from the plurality of pilot signals having the first and second characteristic wherein the pilot signals are detected based on the first characteristic and the best solution is given to the weight values based on the first characteristic of the detected pilot signals see the rejection of claims 1 and 22 above. Agee et al, in the same field of endeavor, teach receiving signals at each antenna element, digitizing the received signals at each

antenna element (i.e. digital baseband signals) and weighting the digital baseband signals and adjusting the numerical representation of their amplitudes and phases (Col. 2, Lines 57-67). Rouphael et al teach adjusting the weight values of each antenna element iteratively (Fig. 3) to optimize the reception quality of pilot signals. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Agee et al with Shapira and Rouphael et al in order to process the signals received by the adaptive antenna array and to separate interference and noise from genuine received signals (Col. 2, Lines 57-67).

As to claims 15-17, Shapira, Rouphael et al, and Agee et al teach all the subject matters claimed above, except for the plurality of data signals associated with a data frequency band within an allocated frequency band; the plurality of pilot signals each is uniquely associated with a pilot signal band within the allocated frequency band and outside the data frequency band (see the recited pertinent reference as recited in claim 1); the first characteristic of each pilot signal from the plurality of pilot signals is at least one from the group of: a frequency of an unmodulated carrier wave , a modulation, and a frequency of a modulated carrier wave or the first characteristic is a spread spectrum pseudo noise sequence or the first characteristic is a time delay . Rouphael et al teach a pilot signal is detected and the signal quality metrics (i.e. signal to noise ratio, or signal to interference noise ratio, and/or so on) are measured to adjust the phase shift (i.e. phase is a function of frequency), delay line, amplifier with variable gain) of the antenna elements (Col. 4, Lines 35-49). One of ordinary skill in the art would clearly recognize that allocating frequency bands to pilot signals is well known in the art and it could be

either dedicating separate channels to pilot signals with the predetermined frequency bands or attaching pilot symbols to data signals. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Rouphael et al with Shapira in order to maximize the received signal energy (Col. 9, Lines 5-7).

Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapira Rouphael et al, and Agee et al, further in view of Sato (US 2005/0083875).

As to claims 18-21, Shapira, Rouphael et al, and Agee et al teach all the subject matters claimed above, except for each pilot signal from plurality of pilot signals is uniquely associated with a modulation code, each pilot signal from the plurality of pilot signals is uniquely associated with the remaining frequencies from the plurality of frequencies; and the first characteristic of each pilot signal from the plurality of pilot signals is the modulated code. Sato teaches a pilot symbol could be either added to each data channel or transmitted using separate channels wherein each pilot signal is responsive to one or a plurality of data signals to determine the delay, dispreading timing of data channel, phase, and amplitude (Pg. 1, Par. 5, 8, and 9). One of ordinary skill in the art would clearly recognize that it is well known in the art that each symbol is associated with a frequency band and each packet of information (i.e. frame or block of information) comprises either a frequency band or a plurality of frequency bands. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teaching of Sato with Shapira and Rouphael et al in order to use an efficient coherent detection scheme (Pg. 1, Par. 9).

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapira, Rouphael et al, and Agee et al, further in view of Shattil (US 2004/0012387).

Allowable Subject Matter

Claims 4 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to claims 4 and 14, the prior art of record fails to teach scanning for each antenna element from the plurality of antenna elements, the stored plurality of signal samples for the first pilot signal to produce an indication of a beginning and end of the data signal associated with the first pilot signal; and initially applying the first weight value to the data signal associated with the first pilot signal at the beginning indication.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Stahle et al (US 5,936,569), Bierly et al (US 2002/0154687), Shattil (US 2004/0012387), Hottinen et al (US 2002/0012380), Yoshida et al (US 5,687,162), McDowell (US 5,952,968), Brookner et al (US 4,720,712), Martin et al (US 2001/0009861), and Winters (US 4,639,914).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Freshteh N. Aghdam whose telephone number is (571) 272-6037. The examiner can normally be reached on Monday through Friday 9:00-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Freshteh Aghdam

May 13, 2005

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